

## ELECTRONIC DEVICE WITH SUPPORT STRUCTURE ANTENNAS

### FIELD

**[0001]** This relates to electronic devices, and more particularly, to electronic devices with wireless communications circuitry.

### BACKGROUND

**[0002]** Electronic devices are often provided with wireless communications capabilities. An electronic device with wireless communications capabilities has wireless communications circuitry with one or more antennas. Wireless transceiver circuitry in the wireless communications circuitry uses the antennas to transmit and receive radio-frequency signals.

**[0003]** It can be challenging to form a satisfactory antenna for an electronic device. If care is not taken, the antenna may not perform satisfactorily, may be overly complex to manufacture, or may be difficult to integrated into a device.

### SUMMARY

**[0004]** An electronic device such as a desktop computer may have a housing. The housing may have conductive portions such as metal walls. The metal walls may be planar walls that form a box-shaped housing. Metal supports for a housing such as housing legs may be coupled to the corners of the housing. The metal legs may run vertically along each of four corners of a box-shaped housing or may otherwise be used in supporting the electronic device.

**[0005]** The electronic device may have wireless circuitry for transmitting and receiving wireless communications. The wireless circuitry may include antennas and radio-frequency transceiver circuitry.

**[0006]** The antennas may be formed in conductive portions of the housing. In an illustrative configuration, the antennas may be slot antennas formed from through holes in the legs. Radio-frequency transceiver circuitry in the housing that is used in transmitting and receiving radio-frequency communications may be coupled to each antenna using a corresponding transmission line. Threaded radio-frequency connectors or other connectors may be used in coupling each transmission line to a corresponding slot antenna.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0007]** FIG. 1 is a schematic diagram of an illustrative electronic device in accordance with an embodiment.

**[0008]** FIG. 2 is a perspective view of an illustrative electronic device in accordance with an embodiment.

**[0009]** FIG. 3 is a side view of an illustrative electronic device slot antenna in accordance with an embodiment.

**[0010]** FIG. 4 is a side view of a pair of illustrative electronic device slot antennas in accordance with an embodiment.

**[0011]** FIG. 5 is a side view of a corner portion of an illustrative electronic device of the type shown in FIG. 2 in accordance with an embodiment.

**[0012]** FIG. 6 is a cross-sectional top view of an illustrative slot antenna formed from a through hole that passes through a support structure such as a leg at a corner of an electronic device in accordance with an embodiment.

### DETAILED DESCRIPTION

**[0013]** An electronic device such as electronic device **10** of FIG. 1 may be provided with wireless circuitry. The wireless circuitry may include antennas such as wireless local area network antennas or other antennas. Electronic device **10** may be a computing device such as a laptop computer, a desktop computer, a computer monitor containing an embedded computer, a tablet computer, a cellular telephone, a media player, or other handheld or portable electronic device, a smaller device such as a wristwatch device, a pendant device, a headphone or earpiece device, a device embedded in eyeglasses or other equipment worn on a user's head, or other wearable or miniature device, a television, a computer display that does not contain an embedded computer, a gaming device, a navigation device, an embedded system such as a system in which electronic equipment with a display is mounted in a kiosk or automobile, a wireless internet-connected voice-controlled speaker, equipment that implements the functionality of two or more of these devices, or other electronic equipment.

**[0014]** As shown in FIG. 1, device **10** may include storage and processing circuitry such as control circuitry **28**. Circuitry **28** may include storage such as hard disk drive storage, nonvolatile memory (e.g., flash memory or other electrically-programmable-read-only memory configured to form a solid state drive), volatile memory (e.g., static or dynamic random-access-memory), etc. Processing circuitry in circuitry **28** may be used to control the operation of device **10**. This processing circuitry may be based on one or more microprocessors, microcontrollers, digital signal processors, application specific integrated circuits, etc.

**[0015]** Circuitry **28** may be used to run software on device **10**, such as internet browsing applications, voice-over-internet-protocol (VOIP) telephone call applications, email applications, media playback applications, reminder list applications, calendar applications, shopping applications, home automation applications, applications for setting alarms and timers, operating system functions, etc. To support interactions with external equipment, circuitry **28** may be used in implementing communications protocols. Communications protocols that may be implemented using circuitry **28** include internet protocols, wireless local area network protocols (e.g., IEEE 802.11 protocols—sometimes referred to as WiFi®—and protocols for other short-range wireless communications links such as the Bluetooth® protocol), cellular telephone protocols, antenna diversity protocols, etc.

**[0016]** Input-output circuitry **44** may include input-output devices **32**. Input-output devices **32** may be used to allow data to be supplied to device **10** and to allow data to be provided from device **10** to external devices. Input-output devices **32** may include user interface devices, data port devices, and other input-output components. For example, input-output devices **32** may include touch sensors, displays, light-emitting components such as displays without touch sensor capabilities, buttons (mechanical, capacitive, optical, etc.), scrolling wheels, touch pads, key pads, keyboards, microphones, cameras, buttons, speakers, status indicators, audio jacks and other audio port components, digital data port devices, motion sensors (accelerometers, gyroscopes, and/or compasses that detect motion), capacitance sensors, proximity sensors, magnetic sensors, force sensors (e.g., force sensors coupled to a display to detect pressure applied to the display), etc. In some configurations, keyboards,